Exploration Docking Hatch (EDH)

Completed Technology Project (2014 - 2017)

Project Introduction

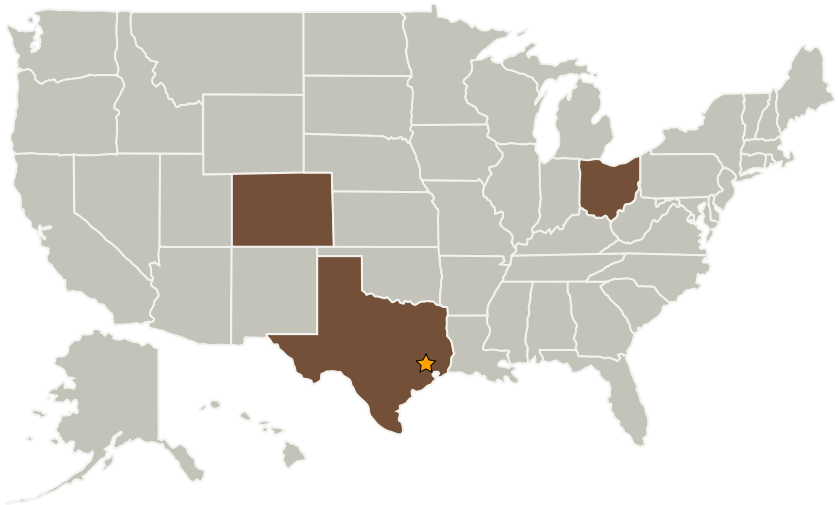
The Exploration Docking Hatch Project was forged as a partnership between the Advanced Exploration Systems Program, the Orion Multi-Purpose Crew Vehicle Program, and JSC Engineering to develop a forward extensible docking hatch applicable to near term uses and longer term exploration needs at a shared cost.

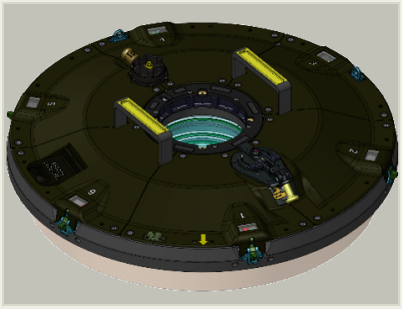
A deep space compatible docking hatch is necessary for missions beyond LEO (low Earth orbit). This project takes steps toward development of a standard, weight-optimized docking hatch system compatible with the international docking standard and available for use by government and commercial partners on the road to exploration. This eliminates redundant development costs among partners and allows partners to focus on their core technologies.

Anticipated Benefits

The Exploration Docking Hatch's elegant design provides a reduced production cost, lighter weight, and increased capability over legacy hatches. Additionally the development of a common core, open source, highly capable, light-weight hatch design allows a starting point for use specific applications thereby reducing or eliminating DDT&E costs for NASA partners across architectures allowing for overall more efficient development programs.

Primary U.S. Work Locations and Key Partners





Docking Hatch

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Co-Funding Partners	Type	Location
Exploration Systems Development Mission Directorate(ESDMD)	NASA Mission Directorate	
Lockheed Martin Space Systems(LMSS)	Industry	Sunnyvale, California

Primary U.S. Work Locations	
Colorado	Ohio
Texas	

Project Transitions

October 2014: Project Start

April 2017: Closed out

Closeout Summary: The completed Exploration Docking Hatch Design features:

- an assembled mass 65% lower than legacy designs
- a pressure carrying capability 56% higher than legacy designs
- an air leak rate 200x lower then typical requirements

The objectives of the Exploration Docking Hatch project have been completed successfully and the design is available as an open source package for industry incorporation into their designs and architectures. Additionally, the NASA design team is on hand for branching design development, evaluation, and consulting as needed.

Organizational Responsibility

Responsible Mission Directorate:
Exploration Systems Development Mission Directorate (ESDMD)

Lead Center / Facility:
Johnson Space Center (JSC)

Responsible Program:
Exploration Capabilities

Project Management

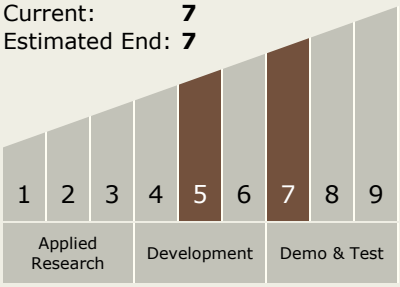
Program Director:
Christopher L Moore

Project Manager:
David W Hall

Principal Investigator:
David W Hall

Technology Maturity (TRL)

Start: **5**
Current: **7**
Estimated End: **7**



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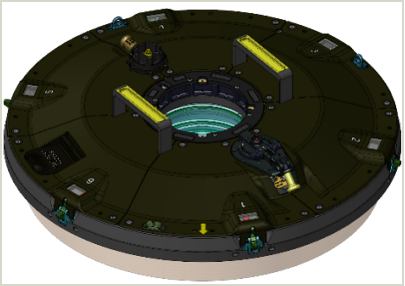
Images



Docking Hatch
Docking Hatch
(https://techport.nasa.gov/image/36958)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.3 Mechanical Systems
    - TX12.3.1 Deployables, Docking, and Interfaces

Target Destinations

The Moon, Mars

Supported Mission Type

Projected Mission (Pull)